Southern Link Inland Port Terrestrial Ecological EcIA

Southern Link Property Ltd

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Southern Link Inland Port – Terrestrial Ecology
EcIA

Document Status

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1 Introduction

1.1 Overview

Southern Link Property Ltd (SLPL) is seeking approvals under the Fast Track Approvals Act 2024 to develop and operate an Inland Port on a 40-ha site on the outskirts of Mosgiel located at 270 – 292 Dukes Road North, Taieri and ancillary activities within the immediately adjacent KiwiRail corridor (see Figure 1; the site comprises both the yellow and blue areas for this assessment).

Vegetation clearance and earthworks are proposed across various areas of the site to establish the Inland Port. The combined area of disturbance is estimated to be 40 ha. The required earthworks and vegetation disturbance are subject to rules in the Dunedin City Council (DCC) District Plan and a Wildlife Act Authority is also required from the Department of Conservation (DOC) for the salvage and release of lizards from the site. The Wildlife Act Authority is being sought separately from the Fast-track approvals process.

e3Scientific Limited (e3s) has been engaged to provide a Terrestrial Ecological Impact Assessment (EcIA) to support the substantive application for the Inland Port. This EcIA characterises existing ecological values at the site and includes an impact assessment of the proposed development.

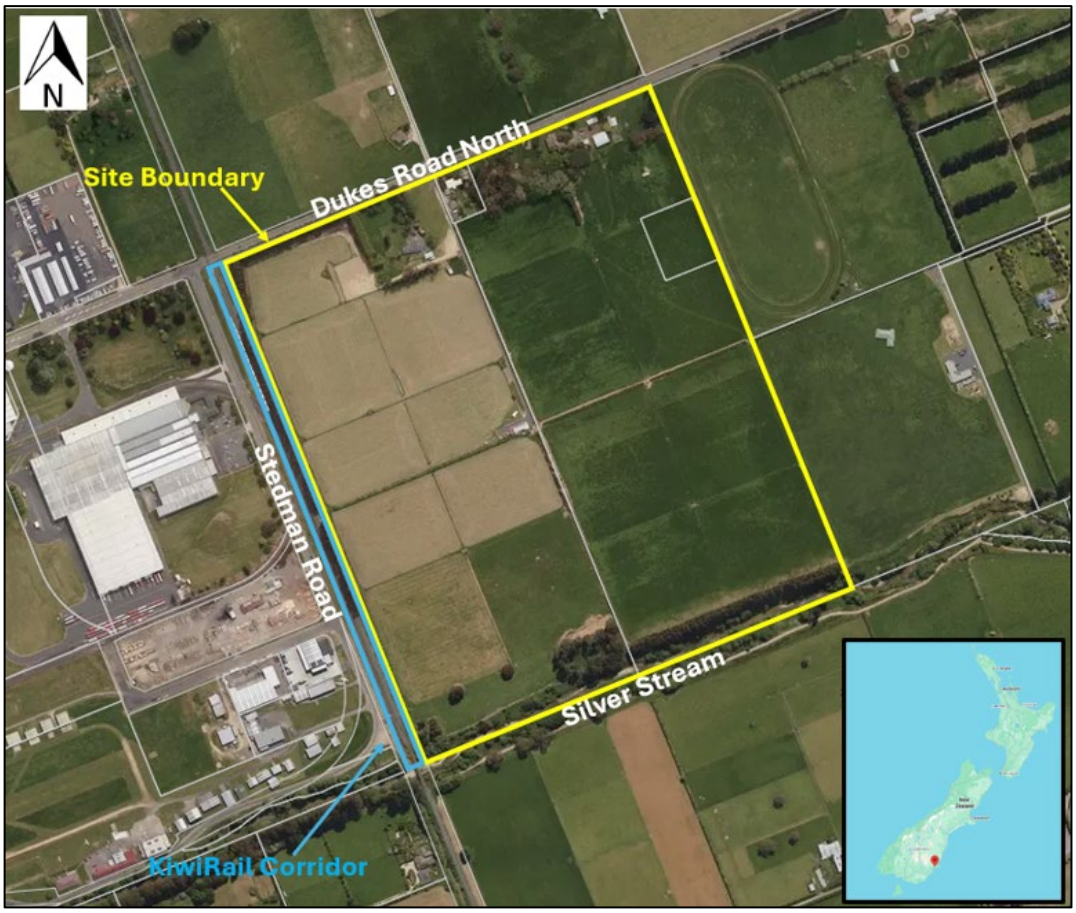

Figure 1: Site Location Plan from Mitchell Daysh.

1.2 Description of the Activity

The Southern Link Inland Port is being advanced by a joint venture between Port Otago and Dynes Transport (SLPL). With a lack of space at Port Chalmers and the Dunedin central business district, SLIP considers that the Mosgiel location is a suitable option for bulk storage and use as a logistics hub as a staging site for shipping, rail, and truck transport. The site covers approximately 40 hectares and is proposed to house large, roofed warehouses, a sealed yard space, and the development of ponds. The site layout is shown in Figure 2. Significant earthworks and removal of vegetation across the 40-ha site will be required for the construction of the infrastructure for the Inland Port.

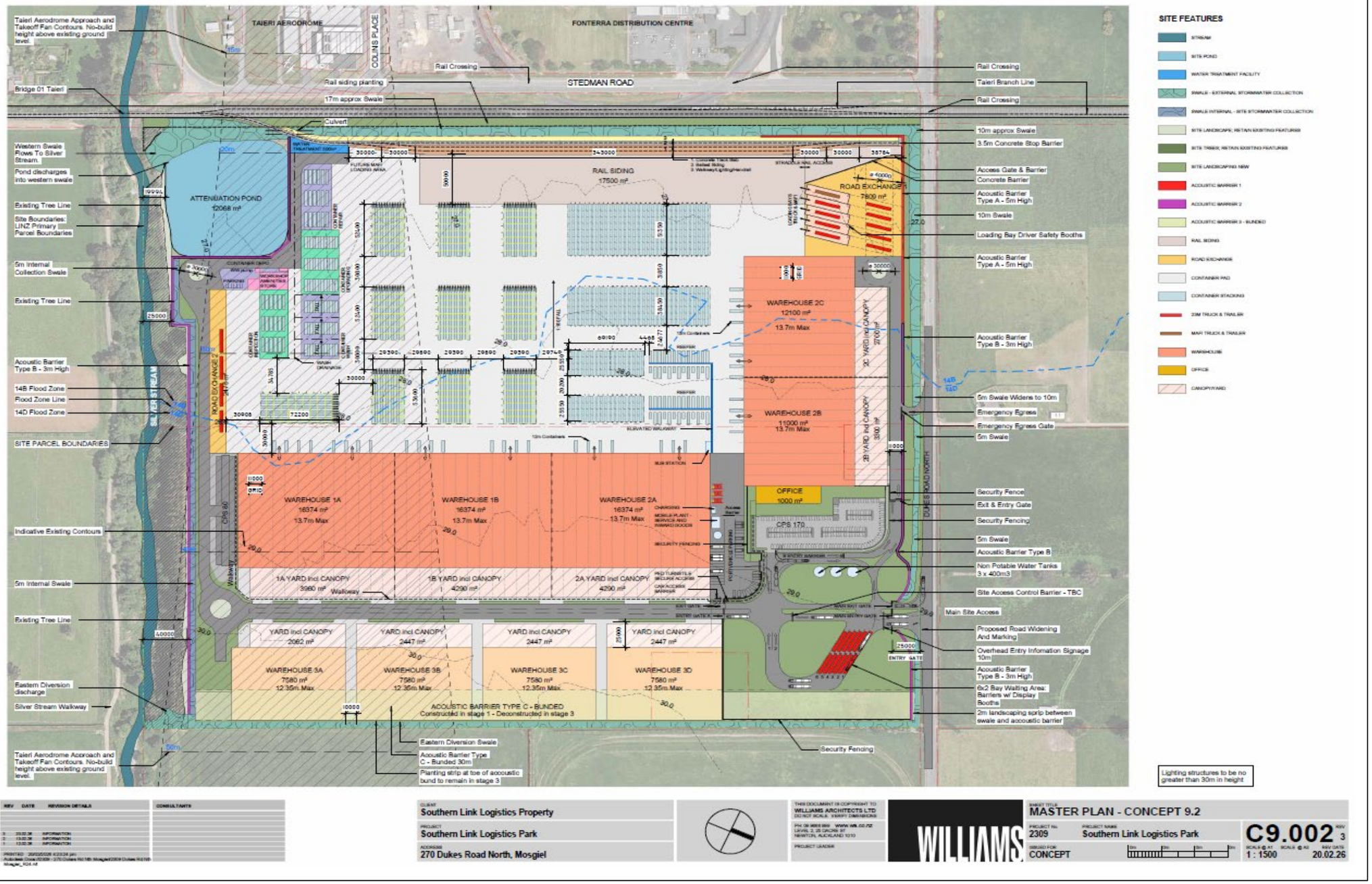

Figure 2: Southern Link Inland Port - Site Layout (From Williams Architects Ltd).

1.3 Scope of the Ecological Report

The terrestrial EcIA is structured as follows:

- Section 2: Methodology
- Section 3: Description of the ecological values of the site including vegetation communities, flora, and fauna.
- Section 4: Assessment of the ecological significance and value.
- Section 5: Assessment of the impact of the proposed activity.
- Section 6: Conclusions.

1.4 Limitations

e3Scientific Limited (e3s) performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental science profession. No warranties, express or implied, are made. The confidence in the findings is limited by the Scope of Work, and limited data due to site visits at one time of year. A full range of biota that are present at this site may not have been seen or recorded; however, desktop research was utilised to aid the assessment.

The results of this assessment are based upon a site inspection conducted by e3s personnel, and information provided in scientific literature. All conclusions and recommendations regarding the site are the professional opinions of e3s personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, e3s assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside e3s, or developments resulting from situations outside the scope of this project.

1.5 Code of Conduct

The senior author of this report is Rebecca Teele. I am the Technical Director – Terrestrial Ecology at e3Scientific Ltd. I have over ten years of experience in ecological assessment, monitoring, restoration planning, and conservation management. I hold a BSc in Ecology with a minor in Statistics, and an MSc with

Distinction in Ecology, both from the University of Otago. I am a Certified Environmental Practitioner (CEnvP), a full member of the Environment Institute of Australia and New Zealand, the New Zealand Ecological Society, and Birds New Zealand.

In regard to the lizard sections of this report and the LMP, which is outside my area of expertise, Dr Mandy Tocher is the lead expert. She is the Principal Herpetologist at LizardExpertNZ. She has over 35 years of experience in lizard surveys, assessment, monitoring, restoration, and conservation management. She holds an MSc and PhD in Zoology, both from the University of Canterbury. She is a RMA Accredited Hearings Commissioner.

We confirm that we have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This report has been prepared in compliance with that Code, as if it was expert evidence presented in proceedings before the Environment Court. Unless we state otherwise, this report is within my area of expertise, and we have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this report.

2 Methodology

The terrestrial EcIA is based on desktop information, a site visit completed on the 9th September 2025, and a lizard survey at the beginning of November 2025.

2.1 Desktop Assessment and Site Visit(s)

The desktop assessment and site visits included:

- Establishing the representativeness of the vegetation and habitats present through a **field survey** and consideration of the expected pre-disturbance vegetation and Land Environments of New Zealand (LENZ) classification (Leathwick, et al., 2003).
- Determination of the presence and significance of plant species and habitats through desktop information, **botanical survey**, and review of the Department of Conservation's threat classification for New Zealand indigenous vascular plants (de Lange, et al., 2024) and the Otago Regional Councils conservation status of indigenous vascular plants in Otago (Jarvie, et al., 2025).
- Determination of the likely presence and significance of avifauna species through the **site visit**, existing scientific knowledge, and review of the Department of Conservation's threat classification for New Zealand birds and the ORC Otago Regional Threat Status for birds (Robertson, et al., 2021) (Jarvie, McKinlay, Palmer, Rawlence, & Thomas, 2025).
- Determination of the likely presence and significance of herpetofauna species through **survey**, existing scientific knowledge, and review of the Department of Conservation's threat classification for New Zealand Lizards and the ORC Otago Regional Threat Status for lizards (Hitchmough R. B., 2026) (Jarvie, et al., 2024). As the lizard survey involved trapping, further detail is provided below.

2.2 Lizard Survey

2.2.1 Gee's Minnow Trapping

During 2-5 November 2025, 150 gee's minnow traps were deployed across the site (see Figure 3). The traps were lizard grade (1/8-inch mesh (3.18 mm)). Trap sites were chosen based on accessibility and availability of lizard habitat and were generally grouped as either 5, 10, or 20 traps. Trap spacings were approximately

10 m, with adjustments made to ensure traps were placed in the most preferable lizard habitat. Traps were baited with tinned pear and contained a moist sponge, shade cloth, and a couple of handfuls of nearby vegetation to add cover. Traps were checked daily with any lizards found recorded and released. Sponges were re-moistened daily, and pear was replaced every second day. Weather was suitable for lizard activity on every day of trapping (>14 °C).

Figure 3: Lizard Trap Locations and Inaccessible Areas.

2.2.2 Manual Habitat and Visual Encounter Searching

Very little manual habitat and visual encounter searching was able to be carried out due to the intensive effort put into trapping. However, during trap deployment and checks, visual encounters and manual catches did occur and were recorded.

2.2.3 Limitations of the Lizard Survey

The lizard survey was limited to areas that were able to be accessed. Parts of the site were not accessible due to the presence of electric fencing and cattle grazing, as well as recent ploughing (approximate locations depicted in Figure 3).

2.3 Ecological Impact Assessment

The assessment of ecological effects for the site has been completed using the Environment Institute of Australia and New Zealand Ecological Impact Assessment guidelines (EIANZ (Roper-Lindsay, Fuller, Hooson, Sanders, & Ussher, 2018), hereafter 'EcIA Guidelines'). The impact assessment follows the steps outlined below:

- The ecological values for the site have been described. These are detailed in Section 3 of this report.
- Ecological values are assigned a score on a continuum scale of Negligible to Very High. These scores are based on an assessment against criteria which are set out in the EcIA Guidelines. The ecological value scores and the rationale are described in Section 4 of this report.
- Determination of the magnitude of the effect that the activity has on the ecological values. The scale of the magnitude also ranges from Negligible to Very High.
- The overall level of effect is then determined by a combination of ecological value and the magnitude of the effect. The overall level of effect categories include Net Gain, Very Low, Low, Moderate, High and Very High. The magnitude of effect and level of effect scores are detailed in Section 5 of this report.
- Where the ecological impacts result in a level of effect greater than Low, effects mitigation has been proposed in Section 5.

3 Existing Environment

3.1 Historical and Environmental Context

The site is located within the Tokomairiro Ecological District of the Otago Coast Ecological Region (DOC, 2025) and within LENZ environment L2.1b (MFE, 2009). The pre-human vegetation cover of the site (LENZ unit L2.1b) would have comprised entirely of swampland.

After the arrival of the first Europeans settlers in the mid-1800s the land was modified by transforming swamplands into farmland through extensive drainage. Present day, the main land use of the Taieri Plain is agriculture, as the land is highly productive with fertile soils (ORC, 2013). In the only large remaining area adjoining Lake Waihola, raupo, *Carex Secta, C. oriaacea,* harakeke, and locally, crack willow dominate (Leathwick, et al., 2003). Under the Dunedin City Council District Plan the area is zoned Taieri Plain Rural (DCC, 2025). To the southeast of the property, the area is zoned Industrial with a Fonterra distribution centre present along with the Taieri Aerodrome, while the north, east, and south are zoned as Taieri Plain Rural. There is also the Taieri Aerodrome Flight Fan running through the south of the site which has height restrictions, and the site is in the North Taieri floodplain.

The Threatened Environment Classification (TEC) (MWLR, 2025) is a combination of Land Environments of New Zealand, the Land Cover Database and the Protected Areas Network. This site is located within Category 1 TEC, which has less than 10 % of the indigenous vegetation cover left.

3.2 Physical Environment

The site is located on the Taieri Plains, on the outskirts on the Mosgiel township. The site is surrounded primarily by grazed pasture with scattered houses and industrial infrastructure on the southwest boundary. The southeast boundary runs along Silver Stream. The soils consist of alluvial and loess soils found in coastal Otago lowlands occurring on flat, poorly drained sites on flood plains. The altitude of the sites varies between approximately 28 and 33 m above mean sea level (a.m.s.l.). The alluvial filled basin that forms the Taieri Plains has gentle topography which

the Taieri River meanders cross. The Taieri River has two major tributaries, Silver Steam and Waipori River that also flow through the Taieri Plains (ORC, 2013).

Based on the 1:250,000 Geological Map of New Zealand the geology of the area includes:

- Late Pleistocene river deposits, consisting of poorly consolidated, slightly weathered sandy quartz, schist, or volcaniclastic-derived gravel and sand.
- Holocene river deposits, consisting of poorly consolidated often poorly sorted fine to bouldery gravel with sand and mud (GNS , 2025)

3.3 Biological Environment

3.3.1 Vegetation Communities

The vegetation present at the site can be classified into six different communities. The dominant community is Grazed Pasture; however, Shelterbelts, a Stream Edge, a Stream Buffer (1-30 m), Northwest Grassland, and Curtilage Areas are also present. The vegetation communities are described below and shown in Figure 4 below. A full species list for each community is provided in Appendix 1. Of the 36 plant species observed across the site, four were indigenous (being kohukohu (*Pittosporum tenuifolium*), lemonwood (*Pittosporum eugenioides),* koromiko (*Veronica salicifolia*) and *Muehlenbeckia australis*) while the remaining were exotic.

Figure 4: Vegetation Communities Present Within the Site.

Grazed Pasture

The site is predominantly covered by grazed, tilled monoculture crops and pasture that is actively maintained. All 16 plant species observed in this community are exotic. The vegetation in the paddocks is dominated by exotic pasture grasses and crops as shown in Figure 5, while herbaceous plants are also present. Species include cocksfoot (*Dactylis glomerata*), swede (*Brassica napus* var. *napobrassica),* chickweed (*Stellaria media*), common mouse-ear chickweed (*Cerastium fontanum),* scotch thistle (*Cirsium vulgare*), stinging nettle (*Urtica incisa*), white clover (*Trifolium repens*), field parsley (*Aphanes arvensis*), broad-leaved dock (*Rumex obtusifolius*), shepherd's purse (*Capsella bursa-pastoris*), lawn daisy (*Bellis perennis*), corn speedwell (*Veronica arvensis*), yarrow (*Achillea millefolium*), wall fumitory *(Fumaria muralis*), common groundsel *(Senecio vulgaris*) and *Poa annua*.

Figure 5: Grazed Pasture.

Shelterbelts

The shelterbelt hedgerows dividing paddocks are composed of a mix of elderberry (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*). Eucalyptus trees run along the northeast, southeast, and southwestern boundaries of the site, with Lawson's cypress (*Chamaecyparis lawsoniana*) growing alongside them as shown in Figure 6. Scattered along the edges of these trees are two native species: kohukohu (*Pittosporum tenuifolium*) and lemonwood (*Pittosporum eugenioides*).

A stand of eucalyptus of approximately 4893 m^2 is also located along the southeast boundary of the site by Silver Steam.

Figure 6: Shelterbelts.

Northwest Rank Grassland

The Northwest Grassland corner of the site is dominated entirely by exotic rank grass species as shown in Figure 7. The vegetation cover is primarily cocksfoot

grass (*Dactylis glomerata*). Also present is common vetch (*Vicia sativa*), wild broom (*Cytisus scoparius*), meadow buttercup (*Ranunculus acris*), yarrow (*Achillea millefolium*), gorse (*Ulex europaeus*) and common dandelion (Taraxacum officinale). The edge of the community has a reasonable amount of eucalyptus leaf litter covering the ground, which has accumulated from the eucalyptus trees that run along the border of the community.

Figure 7: Northwest Rank Grassland.

Stream Edge

The Stream Edge lacks native riparian vegetation, and the substrate consists of gravel and sand with humic organic matter present as shown in Figure 8. The vegetation community is composed of all exotic species, including yorkshire fog (*Holcus lanatus*), ragwort (*Jacobaea vulgaris*), foxglove (*Digitalis purpurea*), self-heal (*Prunella vulgaris*), monkey musk (*Erythranthe guttata*), and patches of blackberry (*Rubus fruticosus)*.

Figure 8: Stream Edge.

Stream Buffer (1–30 m)

The Stream Buffer community comprising of vegetation within approximately 1 to 30 metres of the stream is predominately composed of exotic species with two indigenous species, koromiko (*Veronica salicifolia)* and *Muehlenbeckia australis*, which are sparsely distributed. The exotic species include a mix of shrubs, herbs, grasses and trees including abundant blackberry (*Rubus fruticosus*), and yorkshire fog (*Holcus lanatus*), elderberry (*Sambucus nigra*), sycamore (*Acer pseudoplatanus), Dryopteris affinis, Lolium perenne*, white clover (*Trifolium repens),* wild broom *(Cytisus scoparius),* gorse *(Ulex europaeus),* cocksfoot *(Dactylis glomerata),* grey willow (*Salix cinerea), Prunus* sp., hawthorn (*Crataegus monogyna*), chickweed *(Stellaria media)* and common alder *(Alnus glutinosa)*. The vegetation reflects a highly modified, exotic-dominated community with limited native presence as shown below in Figure 9.

Figure 9: Stream Buffer (1 – 30 m).

Curtilage Area

The curtilage areas consisted of residential dwellings, driveways, railway tracks, gardens, and associated farming sheds as shown in Figure 10. These areas contained similar species to those found elsewhere on the site, with some additional species present in the domestic gardens.

Figure 10: Curtilage Community Photographs.

At Risk and Threatened Flora

Of the species listed above in the vegetation communities none are classified under the national New Zealand Threat Classification System (NZTCS) as Threatened or At Risk (de Lange, et al., 2024). Further, no species are classified as Threatened or At Risk under the regional Otago Threat Classification system (Jarvie, McKinlay, Palmer, Rawlence, & Thomas, 2025).

3.4 Avifauna

The site includes a variety of suitable habitats that could be utilised by a range of indigenous fauna species. Table 1 describes the avifauna species observed during the site visit and those that are likely to utilise the site. Where species were not observed, the likelihood of their presence is provided, based upon our professional knowledge of populations and distribution and habitat preferences, along with desktop review of scientific literature, eBird (eBird, 2025), and iNaturalist (iNaturalist, 2025).

Introduced passerine and waterfowl species are known to be in the area, however, for the purpose of the EcIA exotic species hold limited value under the assessment criteria and consequently have not been assessed further.

Table 1: National and Regional Conservation Status of Indigenous Avifauna Species (Robertson, et al., 2021) (Jarvie, McKinlay, Palmer, Rawlence, & Thomas, 2025).

Species	National Conservation Status	Regional Conservation Status	Likelihood of Occurrence	Frequency of Occurrence	Breeding Season	Notes
Riroriro / grey warbler *(Gerygone igata)*	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	August to February	Suitable nesting and foraging habitat present. Nest anywhere there are trees and scrub. Nineteen birds observed during site visit.
Pūtangitangi / paradise shelduck (*Tadorna variegata)*	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	August to February	Some nesting and foraging habitat is present along stream and on grasslands. Herbivorous with a preference for grasses and clover. Known high risk species to aircraft.
Tarāpunga / red-bill gull (*Larus novaehollandiae scopulinus)*	At Risk - Declining	At Risk – Regionally recovering	High	Seasonal foraging	September – January	Commonly seen in coastal towns and peripheries. Highly varied diet outside of breeding season including small vertebrates, human sources from towns, discard from fishing boats and garage at rubbish dumps.
Pīwakawaka / South Island fantail *(Rhipidura fuliginosa fuliginosa)*	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	October to February	Suitable nesting and foraging habitat present including Stream Buffer and Shelterbelts. Eight birds observed during site visit.
Spur-winged plover (*Vanellus miles novaehollandia)*	Not Threatened	Not Threatened	Present - Observed	Resident	April to November	Suitable nesting and foraging habitat present, will nest in pasture and cropland. Highly territorial and fly at low to medium altitudes while being persistent in modified landscapes.
Tōrea / South Island pied oystercatcher (*Haematopus finschi*)	At Risk – Declining	Threatened - Regionally Vulnerable	Present - Observed	Seasonal foraging	August to January	Some suitable foraging habitat present. Populations generally move to inland riverbeds and farmlands to breed. Forge on pasture. More associated with damp ground and intertidal habitats than open water features such as ponds.
Korimako / bellbird (*Anthornis melanura* subsp. *melanura*)	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	September to February	Some suitable nesting and foraging habitat present including exotic Shelterbelts and Stream Buffer.

Kōtare / sacred kingfisher (*Todiramphus sanctus vagans)*	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	October to January	Some suitable foraging habitat is present along Stream Edge community, open grassland and shelterbelts. Often perch over water or open country looking for prey with diet including a wide range of terrestrial and aquatic invertebrates and lizards.
Kāhu / swamp harrier (*Circus approximans)*	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	September to April	Some suitable foraging habitat. Opportunistic hunter from roadkill but also actively hunts in opens areas for small birds, mammals and insects. Can nest in long grass.
Tūī / *(Prosthemadera novaeseelandiae novaeseelandiae)*	Not Threatened	Not Threatened	Present - Observed	Sporadic foraging	September to February	Limited nesting and foraging habitat present on site. Nest in native forest, scrub, and gardens. Feed on nectar and fruit.
Karoro / southern black-backed gull (*Larus dominicanus dominicanus)*	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	September – March	Found all over non-forested habitats including farmland.
Kererū / New Zealand pigeon (*Hemiphaga novaeseelandiae)*	Not Threatened	Not Threatened	High	Resident (year-round)	Year round	Some suitable foraging and perching habitat. Can inhabit a wide variety of forest types including farmland shelterbelts and are known to spend time on the ground feeding on clover and other herbs.
Pīpīwharauroa / shining cuckoo (*Chrysococcyx lucidus)*	Not Threatened	Not Threatened	High	Seasonal	October – March	Suitable nesting and foraging habitat. Are brood parasites laying eggs in grey warbler nests. Wide distribution including in farmed areas and wherever their host species grey warbler live.
Kārearea / eastern falcon (*Falco novaeseelandiae novaeseelandiae)*	Threatened – Nationally Vulnerable	Threatened - Regionally Vulnerable	High	Sporadic foraging	August – May	Some foraging habitat in Shelterbelts particularly eucalyptus stand. Breed in a variety of habitats from the coast to above the tree line and may also breed in more intensively farmed areas where suitable bush remnants remain. Prey on small to medium sized birds.
Warou / welcome swallow *(Hirundo neoxena)*	Not Threatened	Not Threatened	Present - Observed	Resident (year-round)	August – March	Suitable foraging on site in Stream Buffer and Stream Edge and breeding habitat nearby including manmade structures e.g. bridges. Forage aerially for small invertebrates often sweeping them up from the water. Often also found by ponds.

Kawaupaka / little shag (*Microcarbo melanoleucos brevirostris)*	At Risk - Relict	Threatened – Regionally Vulnerable	Moderate	Resident (year-round)	August – March	Some suitable foraging and breeding habitat including Stream Edge and Stream Buffer. Also attracted to ponds. Known to feed in small patches of shallow water on small fish, eels, crustaceans, insects etc., and breed in trees overhanging water.
Māpunga / black shag (*Phalacrocorax carbo novaehollandiae*)	At Risk - Relict	Threatened – Regionally Endangered	Moderate	Resident (year-round)	Year round	Some suitable foraging habitat including the stream present on site. Also attracted to ponds. Known to feed on small and medium sized fish along with freshwater crayfish, larger invertebrates, molluscs and ducklings.
Pāpango / New Zealand scaup (*Aythya novaeseelandiae)*	Not Threatened	Not Threatened	Moderate	Resident (year-round)	October – March	Limited suitable foraging and nesting habitat present. More common on shallow lowland lakes and slow flowing rivers, often congregate in sheltered areas near willows or reed beds. Breed on the ground close to water.
Tauhou / silvereye *(Zosterops lateralis lateralis)*	Not Threatened	At Risk - Declining	High	Resident (year-round)	August – February	Some suitable foraging and nesting habitat present. Found throughout New Zealand including on farmland but are less common on open grasslands areas of Otago. Omnivorous and eat a range of small insects.
Tarāpuka / black-billed gull (*Larus bulleri)*	At Risk - Declining	Threatened – Regionally Vulnerable	High	Seasonal – winter migrant feeding ground	August – March	Breed on inland gravel riverbeds but winter foraging habitat present in Grazed Pasture. Also known to feed on aquatic and terrestrial invertebrates.
Matuku moana / white-faced heron (*Egretta novaehollandiae*)	Not Threatened	Not Threatened	Low	Resident (year-round)	June – April	Some suitable foraging and nesting habitat, forages on damp pastures and can nest on man manmade structures and treetops. Commonly feed in almost any aquatic habitat including small fish and insect.
Ruru / morepork *(Ninox novaeseelandiae novaeseelandiae)*	Not Threatened	Threatened – Regionally Vulnerable	High	Resident (year-round)	September - May	Some suitable habitat. Commonly in urban parks and well vegetated suburbs throughout New Zealand, however, are sparse through eastern and central South Island.
Pūkeko (*Porphyrio melanotus*)	Not Threatened	Not Threatened	High	Resident (year-round)	Year round	Suitable foraging and nesting habitat present, typically found near sheltered water including streams and commonly forage in paddocks including crops.

3.5 Bats

A single, unidentified bat species was recorded in the Taieri Plains in 1988 (DOC, 2025). Since then, only one further detection in the Tokomairiro Ecological District has occurred in 2023, however this was south of Balclutha over 70 km away from the site (DOC, 2025). The site offers limited habitat for bats due to the absence of mature native forests and old or dead standing trees with hollows or other features suitable for roosting. Therefore, with the lack of detections and habitat present, there is a negligible likelihood of bat presence, and they are not considered further within this assessment.

3.6 Invertebrates

Although native invertebrate species can occur in exotic pastures, research indicates that they are generally more abundant and diverse in areas dominated by native vegetation in comparison to exotic ecosystems (Derraik, Rufaut, Closs, & Dickinson, 2005). The largest and most diverse populations of native invertebrate species in New Zealand are generally found in relatively undisturbed indigenous plant communities (Patrick, 1994). In contrast, exotic invertebrate species are more commonly found in modified landscapes such as pastoral grasslands and less than 5 % of native insect species have successfully adapted to solely exotic plant communities. Given these factors, the inclusion of invertebrate surveys was not considered necessary for this assessment, and invertebrates are not considered further within this assessment

3.7 Herpetofauna

There are several species of herpetofauna whose geographic ranges intersect with the site. The habitat present has a history of modification; however lizards persist in several of the vegetation communities. The possible herpetofauna species present are described in Table 2 below.

The only species found at the site during survey were tussock skink (*Oligosoma chionochloescens*). The survey results have been extrapolated to map the areas at site that are most likely to provide habitat for tussock skink (Figure 11), based on where tussock skinks were located during the survey (and where unlikely

present shown by all unshaded areas inside the site boundary). A total of 16 tussock skink were recorded during lizard trapping at the site.

The survey results indicate that the tussock skink densities at the site are depleted and not numerous. The total number of individuals within the combined "Certain" and "Likely" habitat is calculated to be ca. 200- 300 southern grass skinks.

Where species have been described as "Unlikely" to be present in Table 2, this is based on survey results, the habitats observed at the site, professional knowledge of populations and distribution, and desktop review of scientific literature and lizard records (including the DOC Herpetofauna database and iNaturalist) (iNaturalist, 2025). Any species considered unlikely to be present are not considered further in the EcIA.

Figure 11: Tussock Skink Records and Likely Habitat Onsite.

Table 2: National and Regional Conservation Status of Indigenous Herpetofauna Species (Jarvie, et al., 2024) (Hitchmough R. B., 2026).

Species	National Conservation Status	Regional Conservation Status	Likelihood of Occurrence	Notes
Tussock skink *(Oligosoma chionochloescens)*	At Risk - Declining	At Risk - Declining	Present - Observed	Tussock skink were found at the site through trapping and opportunistic searching in suitable conditions. They were located in less disturbed habitat with suitable cover along fence lines, shelterbelts, and curtilage areas. This is typical of their usual habitat in rocky and grassy areas that retain moisture.
McCanns Skink (*Oligosoma maccanni)*	Not threatened	Not threatened	Unlikely	Although McCanns skink are known to be present in nearby environments, they typically occupy dry rock environments. Suitable habitat was sparse at the site, and none were observed during the survey.
Kōrero gecko (Woodworthia "Otago/Southland large"	At Risk - Declining	At Risk - Declining	Unlikely	Korereo gecko are known to be present in nearby environments and usually inhabit rocky areas but occasionally occupy shrubland and forest. Suitable habitat was not found at the site, and none were located during the survey.
Jewelled gecko / Moko kakariki (*Naultinus gemmeus*)	At Risk - Declining	At Risk - Declining	Unlikely	Jewelled gecko prefer shrubland and forest with dense small-leaved native vegetation which was not present at the site.
Herbfield skink (*Oligosoma murihiku*)	At Risk - Declining	At Risk - Declining	Unlikely	Herbfield skink prefer less disturbed shrubland, wetland, and herbfield communities than were present at the site and were not found during the survey.
Otago green skink (*Oligosoma* aff. *chloronoton* "eastern Otago")	At Risk - Declining	At Risk - Declining	Unlikely	Green skink usually inhabits damp areas with woody or rocky cover such as gullies, riparian areas, rock piles. However, habitat at the site has a history of disturbance and is not suitable.

4 Ecological Significance and Value

The assessment of significance of the ecological values associated with the site are based on the following:

- The Dunedin City Council Second Generation District Plan (DCC 2GP) (DCC, 2024) Criteria for assessing areas of significant indigenous vegetation and the significant habitats of indigenous fauna; Appendix, A1.2(https://2gp.dunedin.govt.nz/plan/pages/plan/book.aspx?exhibit=DCC2GP);
- The Ecological Impact Assessment (EcIA) EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems, 2nd edition (Roper-Lindsay, Fuller, Hooson, Sanders, & Ussher, 2018);
- New Zealand's Department of Conservation threatened flora and fauna series;
- Proposed Otago Regional Policy Statement significance criteria (pORPS (ORC, 2025)); and,
- National Policy Statement for Indigenous Biodiversity 2023 Amended December 2025 criteria (NPS – IB (Ministry for the Environment, 2025)).

4.1 Significance of Terrestrial Vegetation Communities

The assessment of all six vegetation communities against the above criteria is presented in Table 3 below, including the rationale for ecological assessment values given to each respective vegetation community. The values range from Low to Very High for the EIANZ sore, and Yes/No for DCC 2GP, ORPS and NPS – IB criteria.

Please note, the vegetation communities that meet the Rarity criteria below, do so because of the presence of Threatened/At Risk bird or lizard species utilising the habitat, even though the habitats are just grazed paddocks/dominated by exotic species. Many of New Zealand's threatened wildlife species have adapted to modified habitats that are available in the absence of natural/original native habitats to persist.

Table 3: Ecological Assessment of Vegetation Communities using the Ecological Criteria in the EIANZ Guidelines, DCC 2GP and ORPS Significance Criteria's and the NPS-IB SNA Criteria.

Grazed Pasture					
Matter	**Rationale**	**EIANZ Score**	**DCC 2GP**	**pORPS**	**NPS - IB Criteria**
Representativeness	The vegetation community is highly disturbed compared to that present pre-human in the Ecological District. Historically the area was a swampland. Land has been drained and indigenous vegetation cleared for agricultural use with no indigenous species remaining.	Low	No	No	No
Rarity and Distinctiveness	The area is habitat for the Threatened (Regionally Vulnerable) South Island pied oystercatcher and the At Risk – Declining tussock skink. Additionally potential foraging habitat for the Threatened (Regionally Vulnerable) black billed gull and the Threatened eastern falcon. The Land Environment within which the site sits has <10% of indigenous cover remaining. The vegetation community does not contain species that are Threatened or At Risk (Regionally or Nationally), or at their distributional limit, or that have developed due to unique environmental factors.	Moderate	Yes	Yes	Yes
Diversity and Pattern	The area consists of exotic pasture grassland. The site is dominated by exotic plant species and has been significantly modified for agricultural use. As a result, it lacks natural plant diversity and indigenous plant species richness but does support some indigenous avifauna diversity.	Low	No	No	No
Ecological Context	The site provides habitat and linkage for avifauna species who use the area, as well as mitigatory species intermittently when moving to summer inland breeding grounds, such as the At Risk South Island pied oystercatcher, and Threatened (Regionally Vulnerable) black billed gull. The community also provides connectively between adjacent habitat for At Risk tussock skink.	Moderate	Yes	Yes	Yes
Protected Areas	Not an existing protected area.	NA	No	NA	NA
Size	The site is not of a size that makes this community significant for ecological purposes.	NA	No	NA	NA
Overall EIANZ Ecological Value Score, DCC 2GP & ORPS significance criteria, and NPS-IB SNA criteria		Moderate	Yes	Yes	Yes

Shelterbelts					
Matter	Rationale	EIANZ Score	DCC 2GP	pORPS	NPS - IB Criteria
Representativeness	The vegetation community is highly disturbed compared to that present pre-human in the Ecological District. Historically the area was a swampland. Land has been drained and indigenous vegetation cleared for agricultural use with very limited indigenous species remaining.	Low	No	No	No
Rarity and Distinctiveness	The Land Environment within which the site sits has <10% of indigenous cover remaining. The vegetation community does not contain species that are Threatened or At Risk (Regionally or Nationally), or at their distributional limit, or that have developed due to unique environmental factors. However, the habitat supports At Risk tussock skink and may support Regionally At Risk silver eye, Regionally Threatened morepork and the Nationally Threatened eastern falcon.	Moderate	Yes	Yes	Yes
Diversity and Pattern	The area consists primarily of exotic hedges, two native pittosporum species and a eucalyptus stand, which introduce small variations in ecological gradient, however, the site is dominated by exotic plant species and has been significantly modified for agricultural use. As a result, it supports limited natural diversity and lacks indigenous species richness.	Low	No	No	No
Ecological Context	Exotic shelterbelts are a buffering strip and connectivity, around the paddocks, providing nesting and foraging habitat for grey warblers and fantails. They provide perching for Nationally Threatened eastern falcon, Regionally At Risk silver eye and Regionally Threatened morepork, along with also providing habitat for At Risk tussock skink. Additionally, tui use eucalyptus trees as a food source in winter.	Moderate	Yes	Yes	Yes
Protected Areas	Not an existing protected area.	NA	No	NA	NA
Size	The site is not of a size that makes this community significant for ecological purposes.	NA	No	NA	NA
Overall EIANZ Ecological Value Score, DCC 2GP and ORPS significance criteria, and NPS-IB SNA criteria		Moderate	Yes	Yes	Yes

Northwest Rank Grassland					
Matter	**Rationale**	**EIANZ Score**	**DCC 2GP**	**pORPS**	**NPS - IB Criteria**
Representativeness	The vegetation community is highly disturbed compared to that present pre-human in the Ecological District, which would have been swampland. The land has been drained and disturbed for agricultural use with no indigenous plant species present.	Low	No	No	No
Rarity and Distinctiveness	The Land Environment within the site sits has <10% indigenous cover remaining. The vegetation community does not contain species that are Threatened or At Risk (Regionally or Nationally), or at their distributional limit, or that have developed due to unique environmental factors. It does provide habitat for At Risk tussock skink, however, this species widespread in three regions.	Moderate	Yes	No	No
Diversity and Pattern	The area is highly uniform, lacking species diversity, and occurs across a single ecological gradient. Vegetation structure and species composition show minimal variation.	Low	No	No	No
Ecological Context	The community provides important habitat to At Risk tussock skink and provides connectivity to other tussock skink habitat.	Moderate	Yes	Yes	Yes
Protected Areas	Not an existing protected area.	NA	No	NA	NA
Size	The site is not of a size that makes this community significant for ecological purposes.	NA	No	NA	NA
Overall EIANZ Ecological Value Score, DCC 2GP and ORPS significance criteria, and NPS-IB SNA criteria		Moderate	Yes	Yes	Yes

Stream Edge					
Matter	**Rationale**	**EIANZ Score**	**DCC 2GP**	**pORPS**	**NPS - IB Criteria**
Representativeness	Although the stream is a natural feature the Stream Edge is dominated by exotic species and is not representativeness of the original swampland ecosystem, which has been drained and disturbed for agricultural use.	Low	No	No	No
Rarity and Distinctiveness	This community likely provides foraging habitat for the Regionally Threatened little shag and potentially the Regionally Threatened black shag and morepork, and Regionally At Risk silvereye. The Land Environment within which the site sits has <10% of indigenous cover remaining. The vegetation community does not contain species that are Threatened or At Risk (Regionally or Nationally), or at their distributional limit, or that have developed due to unique environmental factors.	Moderate	No	Yes	Yes
Diversity and Pattern	The site has minimal variation in environmental structure and composition, characterised by being a slope between stream and stream buffer zone with no indigenous riparian vegetation.	Low	No	No	No
Ecological Context	The vegetation is dominated by exotic species but provides connectivity along the stream, and some foraging for species tolerable of modified environments, including the Regionally Threatened little shag, black shag and morepork, and Regionally At Risk silvereye. The area functions as protection and linkage between adjacent habitats for indigenous fauna.	Moderate	Yes	Yes	Yes
Protected Area	Not an existing protected area.	NA	No	NA	NA
Size	The site is not of a size that makes this community significant for ecological purposes.	NA	No	NA	NA
Overall EIANZ Ecological Value Score, DCC 2GP and ORPS significance criteria, and NPS-IB SNA criteria		Moderate	Yes	Yes	Yes

Curtilage Area					
Matter	**Rationale**	**EIANZ Score**	**DCC 2GP**	**pORPS**	**NPS - IB Criteria**
Representativeness	The vegetation community is highly disturbed compared to that present pre-human in the Ecological District. Historically the area was a swampland. Land has been drained and indigenous vegetation generally cleared for agricultural use with no indigenous species remaining.	Low	No	No	No
Rarity and Distinctiveness	The community provides habitat for the Regionally At Risk silvereye and other Not Threatened avifauna, and the At Risk tussock skink. The Land Environment within which the site sits has <10% of indigenous cover remaining.	Moderate	Yes	Yes	Yes
Diversity and Pattern	The level of naturally occurring biodiversity within the site is low, as the vegetation community has been largely established for residential landscaping purposes. While some planted native tree species are present, the overall vegetation exhibits limited structural and spatial variation across the community.	Low	No	No	No
Ecological Context	The site provides habitat and connectivity between adjacent and nearby habitat for the Regionally Threatened morepork and Regionally At Risk silvereye, along with other indigenous species such as fantail and grey warblers. The community provides important habitat to At Risk tussock skink and provides connectivity to other tussock skink habitat.	Moderate	Yes	Yes	Yes
Protected Area	Not an existing protected area.	NA	No	NA	NA
Size	The site is not of a size that makes this community significant for ecological purposes	NA	No	NA	NA
Overall EIANZ Ecological Value Score, DCC 2GP and ORPS significance criteria, and NPS-IB SNA criteria		Moderate	Yes	Yes	Yes

Stream Buffer (1-30 m)					
Matter	**Rationale**	**EIANZ Score**	**DCC 2GP**	**pORPS**	**NPS - IB Criteria**
Representativeness	The vegetation community is highly disturbed compared to that present pre-human in the Ecological District, which would have been swampland. The land has been drained and disturbed for agricultural use with very little indigenous plant species present. Plant species composition is now predominantly exotic invasive weeds.	Low	No	No	No
Rarity and Distinctiveness	The community may provide potential habitat for the Regionally Threatened little shag and potentially the Regionally Threatened black shag and morepork, and Regionally At Risk silvereye. The Land Environment within which the site sits has <10% of indigenous cover remaining. The vegetation community does not contain species that are Threatened or At Risk (Regionally or Nationally), or at their distributional limit, or that have developed due to unique environmental factors.	Moderate	No	Yes	Yes
Diversity and Pattern	The vegetation is dominated by exotic plant species. There are sections of open grass, while other areas are dominated by exotic scrub and woody trees. Despite structural variation, there is very little indigenous diversity in this community.	Low	No	No	No
Ecological Context	The vegetation is dominated by exotic species, however, it provides habitat, buffering, and connectivity, for the Regionally Threatened little shag and the Regionally Threatened black shag and morepork, and Regionally At Risk silvereye along the stream, as well as for other indigenous species such as fantail and grey warblers. The area functions as linkage between adjacent habitats for faunal species.	Moderate	Yes	Yes	Yes
Protected Area	Not an existing protected area.	NA	No	NA	NA
Size	The site is not of a size that makes this community significant for ecological purposes	NA	No	NA	NA
Overall EIANZ Ecological Value Score, DCC 2GP and ORPS significance criteria, and NPS-IB SNA criteria		Moderate	Yes	Yes	Yes

4.2 Significance of Terrestrial Fauna

The ecological values of individual species present or likely present on site has been assessed based upon the EIANZ Guidelines. The higher of the threat status between Regional and National was used to assign the ecological value of each species. Each species threat status has been provided in Table 1 and have been categorised as follows:

- Threatened – any classification (Very High ecological value);
- At Risk – Declining (High ecological value);
- At Risk – any other classification, Data Deficient, and locally important or locally uncommon (Moderate ecological value);
- Not Threatened (Low ecological value).

Relevant species with an ecological value of Moderate or greater have been listed in Table 4 below. All other species have a threat status of Not Threatened or are naturalised/introduced species and subsequently do not provide weighting to the assessment of significance. However, regardless of their threat status, all indigenous fauna are protected under the Wildlife Act 1953, and recommendation/mitigation measures for their protection are provided in Section 5.3.

4.3 Summary of Ecological Values

The ecological values within the site have been assessed using the criteria outlined in the EcIA guidelines. The ecological values for the vegetation communities are associated with the vegetation, the habitat they provide and the presence of fauna. Table 4 summaries this assessment with further detail and rationale described above in Section 4. All vegetation communities satisfy one or more criteria for identification of significant indigenous vegetation or significant habitats of indigenous fauna, qualifying as an SNA, under the DCC 2GP and pORPS significance criteria, and the NPS-IB criteria.

Any area of land that meets one or more significance criteria automatically qualifies as an SNA. Table 3 above, specifically the 'Rationale' column, provides the justification for how each community present on site meets, or doesn't meet, each criterion of an SNA designation. As each community present on site meets

at least one criterion, each community can be classified as an SNA. The spatial extent of each SNA is that of the community mapped (see Figure 4), excluding hardstand areas and buildings. Please note, however, when considering the impact of a development on a piece of land the impact assessment takes into consideration the magnitude of effect, which includes the amount of available habitat in the surrounding area. Many of the vegetation communities present on site are also widespread throughout the Ecological District. The assessment is detailed below and provided in Section 5.2.1 and Table 7.

Table 4: Summary of EcIA ecological value scores for flora and fauna of moderate or greater value.

Species	Ecological Value Score
Vegetation Communities*	
Grazed Pasture	Moderate
Shelterbelts	Moderate
Northwest Rank Grassland	Moderate
Stream Edge	Moderate
Stream Buffer (1-30m)	Moderate
Curtilage Area	Moderate
Individual Species - Flora	
No At Risk or Threatened flora species present.	N/A
Individual Species - Avifauna	
South Island pied oystercatcher (*Haematopus finschi)*	Very High
Eastern falcon (*Falco novaeseelandiae novaeseelandiae*)	Very High
Little shag (*Phalacrocorax melanoleucos brevirostris)*	Very High
Black shag *(Phalacrocorax carbo novaehollandiae)*	Very High
Silvereye *(Zosterops lateralis lateralis)*	High
Ruru / morepork (Ninox novaeseelandiae novaeseelandiae)	Very high
Black-billed gull (*Larus bulleri)*	Very High
Red-billed gull (*Larus novaehollandiae scopulinus)*	High
Individual Species (Herpetofauna)	
Tussock skink (*Oligosoma chionochloescens*)	High

* Please note, the Moderate Value score for vegetation communities is due to Threatened/At Risk bird/lizard species that are utilising them, noting that the vegetation/habitat is largely exotic and most area is taken up by grazed paddocks.

5 Ecological Impact Assessment

5.1 Ecological Impact Assessment Methodology

The following ecological impact assessment (EcIA) follows the EIANZ Ecological Impact Assessment Guidelines for New Zealand. The guidelines are based on the assessment of the ecological values present within the site and the magnitude of the effect within the zone of influence and the wider context of the Ecological District.

The EcIA guidelines provide a series of tables that assist with the assignment of value to the ecological features that will be disturbed and the magnitude of the activity. These tables are provided as Table 11 and 12 and referred to in the discussion below. A summary of the ecological effects and the measures employed to avoid and mitigate the ecological effects of the proposed development are presented in Table 7, Table 8, and Table 9.

5.1.1 Assigning Magnitude of Effect

The EIANZ guidelines provide criteria for assigning the extent of the effects on the ecological values within the area that may be disturbed by the activity. This assessment adopts the criteria for describing magnitude of effect and is provided in Table 5 below.

Table 5: Criteria for describing magnitude of effect (Roper-Lindsay, *et al.*, 2018).

Magnitude	Description
Very High	Total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature.
High	Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature

Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns; AND/OR having a minor effect on the known population or range of the element/feature
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR having negligible effect on the known population or range of the element/feature

5.1.2 Assigning Level of Effect

The level of ecological effect is based on combining the ecological value of an environment that may be impacted by the proposed activities and the magnitude of the effect.

Table 6 is adapted from the EIANZ guidelines to provide a level of effect matrix. For the purpose of this assessment, where the level of effect is Moderate or above, a further management response is required to ensure potential environmental effects are managed appropriately. An effect level of Low or Very Low indicate the effect is ecologically less than minor.

Table 6: Criteria for describing level of effect (Roper-Lindsay, *et al.*, 2018).

		Ecological Value			
		Very High	**High**	**Moderate**	**Low**
Magnitude	**Very High**	Very High	Very High	High	Moderate
	High	Very High	Very High	Moderate	Low
	Moderate	High	High	Moderate	Low
	Low	Moderate	Low	Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low
	Positive	Net Gain	Net Gain	Net Gain	Net Gain

5.1.3 Residual Impact

The residual impact is the final impact level assigned to the proposed activity and potential effects once proposed avoidance/mitigation options have been applied and is outlined in Table 9.

5.2 Direct Effects

5.2.1 Vegetation Clearance

Table 7 sets out the direct disturbance of the proposed Inland Port within each vegetation community and the magnitude of effect has been determined based on the criteria in the EcIA guidelines (Roper-Lindsay, Fuller, Hooson, Sanders, & Ussher, 2018).

The proposed development is estimated to result in a maximum vegetation clearance of approximately 38 ha, of which the majority is grazed pasture. This estimate assumes large-scale excavation across the site to accommodate for significant infrastructure site wide.

The area to be cleared is predominantly comprised of exotic vegetation. Several communities contain no indigenous species, and all vegetation present on site has been planted and is not naturally occurring. Therefore, the loss of indigenous vegetation will be a minor shift in baseline conditions, resulting in a Low to Negligible magnitude of effects for all communities, resulting overall in the level of effect ranging from Very Low to Low.

Table 7: Ecological Impact of Vegetation Disturbance on Each Affected Community.

Vegetation Community	Ecological Value	Maximum Disturbance Area (m^2)	Construction Method	Magnitude of Effect	Rationale	Level of Effect	Mitigation Required (Yes/No)
Grazed Pasture	Moderate	339,752	Large scale excavation for significant infrastructure construction	Negligible	The site has been significantly modified from its natural state, and baseline ecological conditions are already degraded with no indigenous plant species present, therefore, the proposed activity will result in a negligible effect on native vegetation values on site.	Very Low	No
Shelterbelts	Moderate	27,998	Large scale excavation for significant infrastructure construction	Low	The site has been significantly modified from its natural state, and baseline ecological conditions are already degraded with only two native plant species in the community, both of which are scattered and Not Threatened. Therefore, the proposed activity will result in minor changes to conditions, and a minor effect on the known indigenous plant species population.	Low	No
Northwest Rank Grass	Moderate	538	Large scale excavation for significant infrastructure construction	Negligible	The site has been significantly modified from its natural state, and baseline ecological conditions are already degraded with no indigenous plant species present, therefore, the proposed activity will result in a negligible effect on native vegetation values on site.	Very Low	No
Stream Edge	Moderate	1,007	Large scale excavation for significant infrastructure construction	Negligible	The site has been significantly modified from its natural state, and baseline ecological conditions are already degraded with no indigenous plant species present, therefore, the proposed activity will result in a negligible effect on native vegetation values on site, further this section of vegetation will remain largely untouched.	Very Low	No
Stream Buffer	Moderate	11,963	Large scale excavation for significant infrastructure construction	Negligible	The site has been significantly modified from its natural state, and baseline ecological conditions are already degraded. Only two native plant species are present in the community, and both are scattered and Not Threatened. Therefore, the proposed activity will result in a negligible effect to conditions and known indigenous plant species population as this section of vegetation will remain largely untouched.	Very Low	No
Curtilage Area	Moderate	39,349	Large scale excavation for significant infrastructure construction	Low	The site has been significantly modified from its natural state, and baseline ecological conditions are already degraded. Therefore, the proposed activity will result in minor changes to conditions, and a minor effect on the known indigenous plant species population.	Low	No

5.2.2 Habitat Loss

Table 8 below details the likely effects of vegetation clearance on the avifauna and herpetofauna species that utilise the site. The rationale for the magnitude of effect is detailed, along with the overall level of effect and any mitigation required and is based on the criteria set out in the EcIA guidelines.

The proposed activity is expected to result in a Negligible magnitude of effect of foraging and/or nesting habitat for avifauna species, given the highly modified nature of the site, the lack of proposed disturbance to the stream and riparian vegetation, and prevalence of similar habitats and agricultural land uses in the surrounding landscape. The level of effect on Threatened or At Risk avifauna species is assessed as Very Low or Low for all avifauna species.

The proposed activity is expected to result in the loss of 5.64 ha of habitat for tussock skink, with the change assessed as a Moderate to High magnitude of effect (see Table 8). The number of tussock skinks estimated to be present at the site is between ca 200-300, which could be disturbed, displaced, injured, or killed. This is a coarse estimate based on the density in which skinks were caught or observed at the site and the area of habitat at the site being estimated at 5.64 ha.

Table 8: Ecological Impact of Habitat Loss on Faunal Species.

Species	Ecological Value	Magnitude of Effect	Rationale	Level of Effect	Mitigation Required (Yes/No)
Avifauna					
South Island pied oystercatcher (*Haematopus finschi*)	Very High	Negligible	South Island pied oystercatcher are known to forage in the Grazed Pasture and have been observed on-site. However, there is an abundance of similar habitat in the surrounding landscape and Ecological District, with large areas of comparable grazed pasture within the local and wider area, providing alternative foraging opportunities. Given this the proposed development is unlikely to result in any measurable impact on the local or regional distribution and/or population size.	Low	No
Eastern falcon (*Falco novaeseelandiae novaeseelandiae*)	Very High	Negligible	The available habitat supports a reasonable abundance of potential prey species (including native and exotic passerines) and provides a range of vegetation heights and elevated perches suitable for hunting for eastern falcon. However, the area does not represent high-quality or preferred breeding habitat for eastern falcon, and comparable foraging habitat is available in the surrounding landscape and Ecological District. Therefore, the proposed Inland Port development is unlikely to result in any measurable impact on the local or regional distribution or population size of the species.	Low	No
Little shag (*Microcarbo melanoleucos brevirostris*)	Very High	Negligible	Little Shag habitat includes freshwater environments such as rivers, streams, ponds, and wetlands, typically with nearby perching or roosting sites. Suitable habitat is present on-site along the Stream Edge and Stream Buffer communities. While Silver Stream continues through the wider valley, the equivalent quality of riparian vegetation is limited in the surrounding landscape and Ecological District. However, the stream and riparian vegetation is being retained with limited modification. Therefore, the proposed Inland Port development is unlikely to result in any measurable impact on the local or regional distribution and/or population size.	Low	No

Species	Ecological Value	Magnitude of Effect	Rationale	Level of Effect	Mitigation Required (Yes/No)
Black shag (*Phalacrocorax carbo novaehollandiae)*	Very High	Negligible	Black shag habitat includes freshwater environments such as rivers, streams, ponds, and wetlands therefore suitable potential habitat is present on site in the Stream Edge and Stream Buffer communities. While Silver Stream continues through the wider valley, the equivalent quality of riparian vegetation is limited in the surrounding landscape and Ecological District. However, the stream and riparian vegetation is being retained with limited modification. Therefore, the proposed Inland Port development is unlikely to result in any measurable impact on the local or regional distribution and/or population size.	Low	No
Black-billed gull (*Larus bulleri*)	Very High	Negligible	Black billed gull breed on inland gravel riverbeds but are known to forage in winter on farmland habitat present on site in the grazed pasture. However, there is an abundance of similar habitat in the surrounding landscape and Ecological District, including extensive areas of comparable grazed pasture providing alternative foraging options. Therefore, the loss of this foraging site is unlikely to result in any measurable impact on the local or regional distribution and/or population size.	Low	No
Red-billed gull (*Larus novaehollandiae scopulinus)*	High	Negligible	Red-billed gulls are primarily associated with coastal and their peripheral environments throughout New Zealand and are known to scavenge opportunistically on anthropogenic food sources such as rubbish dumps and meat processing facilities. The proposed inland port development has the potential to attract red-billed gulls, however the site does not constitute high-quality habitat for the species. With the implementation of standard waste management and refuse control measures, the presence of scavenging gulls is expected to be minimised. Therefore, the change in habitat is unlikely to have any measurable impact on the local or regional distribution and/or population size.	Very Low	No
Morepork (*Ninox novaeseelandiae novaeseelandiae)*	Very High	Negligible	Morepork can occur in open areas where patches of vegetation remain including sparsely wooded farmland and some urban parks and gardens. They are uncommon on the east coast of the South Island particularly south of Christchurch but are still present. There is an abundance of similar habitat in the surrounding landscape and Ecological District, including extensive areas of comparable Shelterbelts providing alternative foraging options. Therefore, the loss of this foraging site is unlikely to result in any measurable impact on the local or regional distribution and/or population size.	Low	No

Species	Ecological Value	Magnitude of Effect	Rationale	Level of Effect	Mitigation Required (Yes/No)
Silvereye (*Zosterops lateralis lateralis*)	High	Negligible	Silvereye are found in most vegetated habitats including suburban gardens, farmlands woodlands and forest edge, therefore suitable habitat is present on site in the Shelterbelts, Stream Buffer, Stream Edge and Curtilage communities. However, there is an abundance of similar habitat in the surrounding landscape and Ecological District, including extensive areas of comparable Shelterbelts and Curtilage providing alternative foraging options. Therefore, the loss of this foraging and breeding site is unlikely to result in any measurable impact on the local or regional distribution and/or population size.	Very Low	No
Herpetofauna					
Tussock skink (*Oligosoma chionochloescens*)					
Individual	High	High	Estimated between 200-300 skinks will be injured or killed.	Very High	Yes
		Moderate	Estimated between 200-300 skinks will be disturbed or displaced.	High	
Population		Moderate	Habitat at site appears to be typical of current surrounding landscape, however, will be loss and fragmentation of habitat.	High	
Habitat		Moderate	Habitat at the site is proposed to be completely removed by the activity, which is contributing to ongoing loss of habitat.	High	

5.2.3 Bird Strike

The Taieri Aerodrome Flight Fan runs through the south of the site and collisions with aircraft that occur during take-off or landing, will result in bird mortality. The site currently provides habitat for bird species, and the proposed development presents the potential for increased risk of bird strike in relation to increase in onsite vegetation, a proposed stormwater attenuation pond, and buildings providing roost and nesting locations.

The proposed development includes the construction of a stormwater attenuation pond in the southwest corner of the site under the Flight Fan. The pond has been designed to store/manage excess water temporarily, prior to its release/discharge into Silver Stream. The creation of open water habitats within proximity to the neighbouring aerodrome has the potential to increase bird strike as some species will find the open body of water attractive. Birds can also be attracted to ponds when they are dry, due to invertebrates present in sediment build up overtime, or if they are grass lined/based.

The proposed stormwater attenuation pond is expected to be dry, apart from a very limited period during wet weather events. It is recommended that the substrate of the pond be lined (with no sediment), noting that following a large weather event any accumulated sediment in the base of the pond should be removed. Therefore, the attractiveness to At Risk or Threatened bird species is decreased. Further, the average bird strike rate for aerodromes is currently 4 per 10,000 movements, with only one strike recorded (spur-winged plover) in the Civil Aviation Authority (CAA) database for the Taieri Aerodrome (Astral Limited, 2026) and the aviation consultant has recommend a Bird Monitoring and Mitigation Programme is prepared (Astral Limited, 2026). There is also a Wildlife Hazard Management Plan proposed. If the pond is not lined, has sediment, and/or is grassed, the Wildlife Hazard Management Plan and Bird Monitoring and Mitigation Programme will need to incorporate sufficient monitoring and subsequent deterrent measures to lower the risk of bird strike.

The construction of the proposed inland port also involves the development of large warehouses and storage facilities. The large flat roofs and eaves associated with warehouses provide attractive roosting and nesting habitat for species such as black shag, little shag, red-billed gulls, and black billed gull, along with other

Not Threatened and introduced species. These include black-backed gull, starlings, and pigeons. Warehouse structures can mimic natural ledges, provide a hunting vantage point, offer warmth and shelter, and clear flight access, which can lead to increased bird activity which becomes a risk due to the neighbouring Aerodrome. It is expected that a Bird Monitoring and Mitigation Programme will include the removal of roosting and perching opportunities on any structures and that airport deterrent measures including spikes, slanted roofs, lack of eaves and ledges will be carried out.

The proposed development will decrease the level of vegetation present on site overall (refer to Figure 2). There is planting proposed along all boundaries for landscape screening purposes. Native plantings are proposed on the northern boundary and within the northwest corner of the site, eucalyptus along the eastern boundary and the southern boundary at the eastern end, and trees along the western boundary. The addition of trees within the Flight Fan can increase the risk of bird strike to At Risk and Threatened bird species, particularly the increase in tall trees within the Flight Fan. However, given the presence of trees along the site boundaries already and a recommended Bird Monitoring and Mitigation Programme that could monitor for any increase in bird strike, in particular of At Risk or Threatened species with any increase resulting in further deterrent measures implemented (e.g. noise, removal of tall trees), the risk would be lowered.

During construction of the development there will be temporary stockpiling of soil. The recommended Bird Monitoring and Mitigation Programme will need to address this risk.

The level of effects are outlined in Table 9. The effect of bird strike is expected to have a Negligible magnitude of effect for avifauna if all the above proposed mitigation measures are implemented via a Bird Monitoring and Mitigation Programme and Wildlife Hazard Management Plan (see Table 9). Therefore, the Level of Effect is assessed as Very Low to Low. Please note, this is **not** an assessment of risk to aircraft and associated human health and safety.

5.2.4 Wildlife Act Approval

Under the Wildlife Act 1953 all indigenous fauna species are protected. For the proposed development, disturbance to wildlife will occur where lizards are present and could occur while birds are nesting. A Wildlife Act Authority will be sought outside of the Fast Track process to salvage and translocated tussock skink from site. This application will occur via the Department of Conservation and include a Lizard Management Plan detailing the associated management measures necessary to adhere to the Act. No nesting birds will be disturbed during the construction and operation phase if the recommended mitigation measures are adhered to in Table 9 and consequently no Wildlife Act Authority would be required for avifauna.

5.3 Indirect Effects

5.3.1 Noise Disturbance

The proposed development will include activities that will generate noise during both the construction and operational phases. Part of the proposed site falls within 350 m of the existing Industrial Zone where, along with the Taieri Aerodrome zones to the west, have higher noise limits then the surrounding land which falls under Rural Zones in the Dunedin City Council 2nd Generation Plan (2GP). It is noted that Marshall Day Acoustic state noise from road and rail sources outside the site are not subject to any specific noise standards in the 2GP.

The ambient noise levels in the existing environment were measured by Marshall Day Acoustic to be between 50-53 dB L_{Aeq} during the daytime (7am – 10pm) and 41-44 dB L_{Aeq} during the nighttime (10pm – 7am).

Long-Term Operational Noise

The predicted Operational noise levels (which take into account the effect of proposed acoustic barriers) are between 32 – 55 dB L_{Aeq} during the daytime and 30 to 53 dB L_{Aeq} during the night.

The Operational daytime noise will be very similar to the existing ambient noise levels, with only two decibels higher at one location which is in on the western industrial boundary (not the Stream Edge and Buffer boundary). The Operational noise during the night is predicted to be higher in certain locations, however, this

is only in three locations, which are again on the western industrial boundary. Further, two of these locations are only 1 to 4 dB higher than the existing nighttime noise levels.

Unlike construction noise, operational noise is chronic. Potential ecological effects include:

- Ongoing habitat degradation due to persistent noise exposure, leading to reduced occupancy by noise-sensitive fauna;
- Long-term shifts in species composition, favouring disturbance-tolerant species and resulting in a loss of biodiversity; and,
- Barrier effects, where noise discourages fauna from using adjacent habitat or moving across the site, potentially fragmenting ecological connectivity.

Once operational, the inland port will generate ongoing noise from fixed machinery, loading or industrial operations, container wash and repair, and human presence. The proposed noise criteria are 55 dB L_{Aeq} during daytime operation (7am – 10pm) and 45 dB L_{Aeq} at night (10pm – 7pm) for notational boundaries of dwellings, and 65 dB L_{Aeq} at all times at industrial site boundaries, which while at the upper limits, are within the existing noise environments for notable boundaries. The industrial boundary limit is above the current ambient noise levels, however, the Stream Edge or Buffer habitat is not on the boundary of an industrial site. Thus, there are predicted similar noise levels to the current existing ambient noise levels, or else high noise levels are not anticipated to occur along the site boundary that has Stream Edge and Buffer habitats. In all habitats except the Stream Edge and Buffer, there is an abundance of similar habitat in the surrounding landscape and Ecological District that can be utilised by avifauna.

Consequently, during Operation, the impact of noise on At Risk and Threatened avifauna species will have a Negligible magnitude of effect. Therefore, the Level of Effect is Low for avifauna species.

Short-Term Construction Noise

Construction activities will involve high-noise machinery, including earthmoving equipment, heavy vehicles, and various construction tools associated with site preparation and building works. During construction, machinery and power tools will be used and setback from receivers at nearby dwellings is proposed, with a recommended construction noise limits of 70 dB L_{Aeq} during the daytime and 45

dB L_{Aeq} during the night. Given the proposed compliance limits (at compliance setback distances at 1m from a building facade) during the construction phase are above the current ambient daytime noise levels, daytime noise will likely negatively impact avifauna. Potential ecological effects include:

- Habitat avoidance or displacement due to aversion to noise;
- Disruption of breeding, nesting, or foraging behaviour, particularly during peak activity periods for birds and other wildlife; and,
- Acoustic masking, where noise interferes with communication, territory defence, or predator/prey detection.

However, there is to be no nighttime construction and daytime construction will not be an ongoing, chronic noise. Further, the noise from loud construction equipment will be 45 dB L_{Aeq} when between 100 to 200 m away from the point source and the Stream Edge and Buffer are on the southern boundary of the site and approximately two thirds of the site is over 200 from this boundary. It is anticipated that there will be some short-term construction noise above what is currently experienced by wildlife on site. If the construction noise can be limited to as short a period is possible on site, and then loud construction noises kept as far from the Stream Edge and Buffer as possible, and when they are near these habitats kept to as short a time frame as possible, this will decrease the impact. Further, as the Construction will be a short-term activity and thus noise levels, if mobile wildlife are disturbed and avoid the Stream Edge and Buffer, they will recolonise once the Construction noise has ended. In all habitats except the Stream Edge and Buffer, there is an abundance of similar habitat in the surrounding landscape and Ecological District that can be utilised by avifauna.

Consequently, during Construction, the impact of noise on At Risk and Threatened avifauna species will be a Negligible magnitude of effect, which results in a Low Level of Effect with mitigation.

The effects of noise on New Zealand lizards have not been researched. There is evidence that lizards exposed to noise can become desensitised to it, affecting how they orient themselves, move, and interact daily (DOC, 2023). However, the impact of noise on tussock skink will be Negligible magnitude of effect given the proposed translocation off site. Therefore, the Level of Effect is Very Low for tussock skink.

The level of effects are outlined in Table 9.

5.3.2 Light Disturbance

The lighting report produced by Pedersen Read Ltd states the existing lighting environment is generally low, characterised by isolated rural-residential lighting, localised streetlighting at intersections, rail signalling lighting, and floodlighting within nearby industrial properties such as the Fonterra distribution centre. In the surrounding environment, properties to the north, east, and south are zoned as Taieri Rural with residential properties and limited exterior lighting. Neighbouring properties to the southwest area are zoned as Industrial and Taieri Aerodrome, with floodlighting associated with the industrial properties, however aerodrome nighttime operations are extremely limited.

Artificial light at night is known to interfere with bird behaviour by altering their circadian rhythm, increase daily vigilance behaviour and foraging times, effecting navigation, and causing deviation towards and collision with artificially lit structures (Richard, et al., 2021). Changes in behaviour can be harmful to species by increasing energy use, which reduces survival by forcing animals to spend more time foraging or avoiding disturbance. Altered mating patterns may lead to poor mate selection and reduced genetic fitness, while accelerated reproductive behaviour and physiology can cause mismatches with environmental conditions, lowering breeding success and population stability.

Short-Term Construction Lighting

During the construction phase, work will be done during the day with no nighttime construction proposed, however, limited circumstances may require artificial lighting. Daytime hours are 7am until 10pm. The proposed daylight lighting hours also include twilight periods (dawn in winter and dusk throughout the year), which are important for avifauna, as many species are most active during these times and indirect effects are greater. However, construction will not be an ongoing, chronic source of light. It is anticipated that there will be short-term construction lighting above what is currently experienced by wildlife in the Stream Edge and Buffer. If the construction light can be limited to as short a period is possible during dawn and dusk, and kept as far from the Stream Edge and Buffer as possible, and when near these habitats kept to as short a time frame as possible, this will decrease the impact. Further, as the Construction associated light levels will be a short-term activity, the mobile wildlife that are disturbed and might avoid the

Stream Edge and Buffer, will recolonise once Construction has ended. In all habitats except the Stream Edge and Buffer, there is an abundance of similar habitat in the surrounding landscape and Ecological District that can be utilised by avifauna.

Consequently, during Construction, the impact of lighting on At Risk and Threatened avifauna species will be a Negligible magnitude of effect, which results in a Low Level of Effect with mitigation.

Long-Term Operational Lighting

During the operational phase, permanent lighting will include floodlights, towers and lights with control systems with details outlined in the Pedersen Read report. As proposed in the Pedersen Read report, all lighting will be down-facing with zero tilt and shielded to minimize light spill. Lighting will be <3,000K including the road closest to the Stream Edge and Buffer. Some internal areas will be ≤4000k. However, lighting at the site boundaries could be up to 3 lux at any time (for security purposes), which is similar to under a suburban streetlight. Lighting along the southern side of the site will be setback from the site boundary (which runs through the centre of the stream), however exterior lighting may result in spill light onto Silver Stream and the riparian margin (Pederson Read).

For avifauna species in all habitats, except the Stream Edge and Buffer, there is an abundance of similar habitat in the surrounding landscape and Ecological District that they will be able to utilise. However, for avifauna species in the Stream Edge and Buffer there is limited similar habitat in the surrounding landscape and Ecological District and alteration of the baseline light conditions are expected. To mitigate this effect, it is recommended in the first instance to monitor how the Threatened and At Risk avifauna species use the riparian vegetation within the Stream Edge and Buffer both before construction ideally for one year (covering all four seasons), and then during the Ports operation (for one year). If there is a distinguishable difference in behaviour or occupancy, prior to construction compared to operation, a length of stream will need to be replanted at a suitable site within the Ecological District. The size of the stream to be restored (length and width) should be proportional to the level of effect determined from monitoring. The planting must be indigenous shrubs and trees, planted at 1 to 2 m centres respectively. There must be the equivalent tree canopy cover achieved as is

currently present in the Stream Edge and Buffer. The plantings must be maintained until greater than 90 % native cover is achieved.

Consequently, the impact of light on At Risk and Threatened avifauna species, will be a Negligible magnitude of effect. Therefore, the Level of Effect is Low to Very Low for avifauna species with mitigation measures.

Elevated light levels attract insects to the light source, which can disrupt local food webs. This may negatively affect species that rely on insects for food such as tussock skink. However, the impact of artificial lighting on tussock skink will be a Negligible magnitude of effect given the proposed translocation off-site. Therefore, the Level of Effect is Very Low for tussock skink.

The level of effects are outlined in Table 9.

5.3.3 Vibration

The proposed development will include activities that will generate vibration during both the construction and operational phases. Marshall Day have predicted that vibration from all Operational activities will be below the level that is considered just perceptible in normal residential environments (0.3mm/s) and that typical construction activities will comply with appropriate noise and vibration standards.

There is limited scientific understanding of how vibrations might affect New Zealand avifauna. For At Risk and Threatened bird species in all habitats except the Stream Edge and Buffer, there is an abundance of similar habitat in the surrounding landscape and Ecological District that they will be able to utilise. However, for avifauna species in the Stream Edge and Buffer there is limited similar habitat in the surrounding landscape and Ecological District and while the operational activities will comply with standards, this could still alter the baseline vibration conditions currently experienced. In place of existing knowledge, it is recommended that any potential effect is monitored for, monitoring should occur both before development starts for one year (covering all four seasons), and then during operation (for one year), to determine any change in behaviour or use of the Stream Edge and Buffer habitat for the At Risk and Threatened bird species. If a change is detected, a length of stream will need to be replanted at a suitable site within the Ecological District (see Section 5.3.2 'Long-Term Operational

Lighting' for further details). The size of the stream to be restored (length and width) should be proportional to the level of effect determined from monitoring.

Consequently, the impact of light on At Risk and Threatened avifauna species, will be a Negligible magnitude of effect. Therefore, the Level of Effect is Low to Very Low for avifauna species with mitigation measures.

The effects of vibration on New Zealand lizards has not been researched (DOC, 2023). However, the impact of vibration on tussock skink will be Negligible magnitude of effect given their proposed translocation off site. Therefore, the Level of Effect is Very Low for tussock skink.

5.3.4 Species Introduction

Introduction of non-native species through imported goods have the potential to impact ecological values beyond the project site and the wider Ecological District causing highly detrimental and wide spanning repercussions. A Biosecurity Plan is expected to manage all risks associated with international arrivals at the port. The level of effects is outlined in Table 9, which results in a Negligible magnitude of effect with the implementation of a Biosecurity Plan and thus an overall Level of Effect of Very Low to Low.

5.3.5 Increased Human Activity and Introduced Predators

Increased human activity from the development and operation of an inland port in the Taieri Plain Rural Zone which borders the Industrial Zone may attract introduced predators such as feral cats, rats, mice, stoats, and possums. These species are drawn to areas where food (e.g. unsecured waste) and shelter (e.g. buildings and infrastructure) are readily available. Furthermore, bird species such as great black-backed gulls, red-billed gulls may be attracted to rubbish and food scraps, leading to increased congregation at the site, which could pose a safety concern for aviation if flocks are flying nearby to the Aerodrome.

Introduced mammal presence can lead to increased predation pressure on native wildlife, particularly ground-nesting birds, skinks, and invertebrates. Feral cats and other introduced species may also spread diseases such as toxoplasmosis, which can further impact native fauna. These indirect effects have the potential to reduce local biodiversity in the surrounding area. The level of

effects is outlined in Table 9, which is considered to have a Negligible magnitude of effect with appropriate and implemented Predator Control Plan and Waste Management Plan and thus an overall Level of Effect of Low to Very Low.

5.4 Effects Management

Table 9 below provides a summary of the direct and potential indirect effects on fauna and flora species with an ecological value of Moderate or Higher, and the recommended impact management strategies.

Table 9: Summary of Direct and Indirect Effects on Fauna Species and Impact Management for Construction and Operation of Proposed Inland Port (Magnitude and Level of Effect After Impact Management).**

Potential Impacts	Species	Ecological Value	Recommended Impact Management	Magnitude of Effect**	Level Of Effect/Residual Impact**
Fauna direct effects from habitat loss outlined in Section 5.2.2 and 5.2.4	South Island pied oystercatcher, eastern falcon, little shag, black shag, black billed gull and morepork	Very High	• Removal of vegetation greater than one meter in height in all communities should be undertaken outside of main avifauna breeding season (August to March) to avoid disturbing nesting and unfledged birds. Where this is not possible an avifauna survey will be completed within five days of works commencing to identify if there are any nesting sites. If nesting birds are found felling must not commence until fledglings have left the nest(s). • If earthworks occur between August to February (South Island oystercatcher breeding season) an avifauna survey of the pasture will need to be completed within five days of earthworks commencing to identify any nesting birds. If nesting birds are found earthworks must not commence until fledglings have left the nest(s) or earthworks proceed outside of a SQEP approved buffer around the nest. • The vegetation within the Stream Buffer and Stream Edge will be retained. • Obtain and implement a Lizard Management Plan due to tussock skink being present on site, which includes: o Salvage tussock skinks using current best practice methods (a mix of gee's minnow trapping, Artificial Cover Objects (ACOs) with pitfall traps, and hand-searching); and release at a nearby suitable pre-prepared location that includes existing suitable habitat with some enhancement, and predator control (including hedgehogs and temporary mouse suppression to support establishing skinks). Further detail, including the release site location, is provided in the Lizard Management Plan.	Negligible	Low
	Tussock skink	High		Moderate – High	Low
	Silvereye, red-billed gull	High		Negligible	Very Low
Fauna direct effects from bird strike outlined in Section 5.2.3.	South Island pied oystercatcher, eastern falcon, little shag, black shag, black-billed gull, and morepork	Very High	• Implement a Bird Monitoring and Mitigation Programme and Wildlife Hazard Management Plan, which includes but is not limited to: o Stormwater attenuation pond will be dry apart from limited times, have a lined substrate with ongoing sediment removed; or if the pond is not lined, has sediment, and/or is grassed, incorporation of sufficient monitoring and subsequent deterrent measures to lower the risk of bird strike. o Remove roosting and perching opportunities on any structures. o Carry out airport deterrent measures including spikes, slanted roofs, lack of eaves and ledges. o Monitor for any increase in bird strike of Threatened or At Risk species, with any increase resulting in further deterrent measure being implemented. o Large stockpiles of soil/vegetation on site are covered or sufficient deterrent measures in place to prevent birds being attracted.	Negligible	Low
	Silver eye, red-billed gull	High		Negligible	Very Low
Fauna indirect effect from noise disturbance outlined in Section 5.3.1.	South Island pied oystercatcher, eastern falcon, little shag, black shag, black-billed gull, morepork	Very High	Mitigation: • All Acoustic Barriers and activities to be installed and occur as per Site Plan. • Construction noise limited to as short a period is possible on site. • All loud construction noise kept as far from the Stream Edge and Buffer as possible. • Any loud construction noise necessary near the Stream Edge and Buffer to be kept to as short a time frame as possible. • Obtain and implement a Lizard Management Plan due to tussock skink being present on site (as detailed in second Row above).	Negligible	Low
	Silvereye, red-billed gull, tussock skink	High		Negligible	Very Low
Fauna indirect effect from light disturbance outlined in Section 5.3.2.	South Island pied oystercatcher, Eastern falcon, little shag, black shag, black-billed gull, morepork	Very High	Mitigation: • All lighting down-facing with zero tilt and shielded to minimize light spill. • Lighting will be <3,000K including the road closest to the Stream Edge and Buffer. • Limited internal areas will be ≤4000k but no spill will occur outside the site boundary (including to the Stream Edge and Buffer). • Monitor Threatened and At Risk avifauna species use of the Stream Edge and Buffer before construction and then during the Ports operation. If there is a distinguishable difference in behaviour or occupancy, prior to construction compared to operation, the following measure must be implemented. • A length of stream will be replanted at a suitable site within the Ecological District. The size of the stream to be restored (length and width) should be proportional to the level of effect determined from monitoring. The planting must be indigenous shrubs and trees, planted at 1 to 2 m centres respectively. There must be an equivalent tree canopy cover achieved as is currently present in the Stream Edge and Buffer. The plantings must be maintained until greater than 90 % native cover is achieved. • Obtain and implement a Lizard Management Plan due to tussock skink being present on site (as detailed in second Row above).	Negligible. Moderate (for little and black shag).	Low
	Tussock skink	High		Negligible	Very Low
	Silvereye, red-billed gull	High		Negligible	Very Low

Potential Impacts	Species	Ecological Value	Recommended Impact Management	Magnitude of Effect**	Level Of Effect/Residual Impact**
Fauna indirect effect from vibration disturbance outlined in Section 5.3.3.	South Island pied oystercatcher, Eastern falcon, little shag, black shag, black-billed gull, morepork	Very High	• Monitor Threatened and At Risk avifauna species use of the Stream Edge and Buffer before construction and then during the Ports operation. If there is a distinguishable difference in behaviour or occupancy, prior to construction compared to operation, the following measure must be implemented. • A length of stream will be replanted at a suitable site within the Ecological District. The size of the stream to be restored (length and width) should be proportional to the level of effect determined from monitoring. The planting must be indigenous shrubs and trees, planted at 1 to 2 m centres respectively. There must be an equivalent tree canopy cover achieved as is currently present in the Stream Edge and Buffer. The plantings must be maintained until greater than 90 % native cover is achieved. • Obtain and implement a Lizard Management Plan due to tussock skink being present on site (as detailed in second Row above).	Negligible	Low
	Tussock skink	High		Negligible	Very Low
	Silvereye, red-billed gull	High		Negligible	Very Low
Fauna indirect effects from species introduction outlined in section 5.3.4.	South Island oystercatcher, Eastern falcon, little shag, black shag, black-billed gull, morepork.	Very High	To mitigate risks associated with international arrivals, a comprehensive Biosecurity Management Plan will be developed and implemented by a qualified professional. This plan will address the prevention, detection, and control of biosecurity threats including (but not limited to) the management of invasive weeds. The plan must ensure that all operational activities are aligned with national biosecurity standards and that appropriate monitoring and response protocols are in place.	Negligible	Low
	Silvereye, red-billed gull	High		Negligible	Very Low
	Tussock skink	High		Negligible	Very Low
Fauna indirect effects from increased human activity and introduced predators outlined in Section 5.3.5	South Island oystercatcher, eastern falcon, little shag, black shag, black-billed gull, morepork.	Very High	Develop a Predator Control Plan and Waste Management Plan (to ensure all waste is securely stored). A Predator Control Plan should be developed by a qualified professional and cover the whole site targeting feral cats, possums, mustelids, and rodents. Traps could consist to DOC200s for mustelids and rats, Timms traps for possum and victor traps for mice. Traps will need to be regularly maintained and checked in line with best practice guidelines. Bait stations targeting mice are recommended.	Negligible	Low
	Silvereye, tussock skink	High		Negligible	Very Low

6 Conclusions

Southern Link Property Ltd (SLPL) is seeking approvals under the Fast Track Approvals Act 2024 to develop and operate an Inland Port on a 40-ha site on the outskirts of Mosgiel. Moderate to Very High ecological values have been identified on site due to the presence an At Risk skink species and Threatened and At Risk bird species. The site development has incorporated mitigation measures to reduce the effects on lizard and bird species present. The following mitigation measures will reduce the potential effects on the terrestrial ecological values present to Low or Very Low:

Habitat Loss

1. Removal of vegetation greater than one meter in height in all communities should be undertaken outside of main avifauna breeding season (August to March) to avoid disturbing nesting and unfledged birds. Where this is not possible an avifauna survey will be completed within five days of works commencing to identify if there are any nesting sites. If nesting birds are found felling must not commence until fledglings have left the nest(s).
2. If earthworks occur between August to February (South Island oystercatcher breeding season) an avifauna survey of the pasture will need to be completed within five days of earthworks commencing to identify any nesting birds. If nesting birds are found earthworks must not commence until fledglings have left the nest(s) or earthworks proceed outside of a SQEP approved buffer around the nest.
3. The vegetation within the Stream Buffer and Stream Edge will be retained.
4. Obtain and implement a Lizard Management Plan due to tussock skink being present on site, which includes:
    a. Salvage tussock skinks using current best practice methods (a mix of gee's minnow trapping, Artificial Cover Objects (ACOs) with pitfall traps, and hand-searching); and release at a nearby suitable pre-prepared location that includes existing suitable habitat with some enhancement, and predator control (including hedgehogs and temporary mouse suppression to support establishing skinks). Further detail, including the release site location, will be provided in the Lizard Management Plan.

Bird Strike

1. Implement a Bird Monitoring and Mitigation Programme and Wildlife Hazard Management Plan, which includes but is not limited to:
    a. Stormwater attenuation pond will be dry apart from limited times, have a lined substrate with ongoing sediment removed; or if the pond is not lined, has sediment, and/or is grassed, incorporation of sufficient monitoring and subsequent deterrent measures to lower the risk of bird strike.
    b. Remove roosting and perching opportunities on any structures.
    c. Carry out airport deterrent measures including spikes, slanted roofs, lack of eaves and ledges.
    d. Monitor for any increase in bird strike of Threatened or At Risk species, with any increase resulting in further deterrent measure being implemented.
    e. Large stockpiles of soil/vegetation on site are covered or sufficient deterrent measures in place to prevent birds being attracted.

Noise

1. All Acoustic Barriers and activities to be installed and occur as per Site Plan.
2. Construction noise limited to as short a period is possible on site.
3. All loud construction noise kept as far from the Stream Edge and Buffer as possible.
4. Any loud construction noise necessary near the Stream Edge and Buffer to be kept to as short a time frame as possible.
5. Obtain and implement a Lizard Management Plan due to tussock skink being present on site (as detailed *Habitat Loss #4* above).

Lighting

1. All lighting down-facing with zero tilt and shielded to minimize light spill.
2. External lighting will be ≤3,000K including the road closest to the Stream Edge and Buffer.
3. Limited internal areas will be ≤4000k but no spill will occur outside the site boundary (including to the Stream Edge and Buffer).
4. Monitor Threatened and At Risk avifauna species use of the Stream Edge and Buffer before construction and then during the Ports operation. If there is a distinguishable difference in behaviour or occupancy, prior to

construction compared to operation, the following measure must be implemented.

a. A length of stream will be replanted at a suitable site within the Ecological District. The size of the stream to be restored (length and width) should be proportional to the level of effect determined from monitoring. The planting must be indigenous shrubs and trees, planted at 1 to 2 m centres respectively. There must be an equivalent tree canopy cover achieved as is currently present in the Stream Edge and Buffer. The plantings must be maintained until greater than 90 % native cover is achieved.

5. Obtain and implement a Lizard Management Plan due to tussock skink being present on site (as detailed *Habitat Loss* #4 above).

Vibration

1. Monitor Threatened and At Risk avifauna species use of the Stream Edge and Buffer before construction and then during the Ports operation. If there is a distinguishable difference in behaviour or occupancy, prior to construction compared to operation, the following measure must be implemented.
    a. A length of stream will be replanted at a suitable site within the Ecological District. The size of the stream to be restored (length and width) should be proportional to the level of effect determined from monitoring. The planting must be indigenous shrubs and trees, planted at 1 to 2 m centres respectively. There must be an equivalent tree canopy cover achieved as is currently present in the Stream Edge and Buffer. The plantings must be maintained until greater than 90 % native cover is achieved.
2. Obtain and implement a Lizard Management Plan due to tussock skink being present on site (as detailed *Habitat Loss* #4 above).

Species Introduction

6. A comprehensive Biosecurity Management Plan will be developed and implemented by a qualified professional. This plan will address the prevention, detection, and control of biosecurity threats including (but not limited to) the management of invasive weeds. The plan must ensure that all operational activities are aligned with national biosecurity standards and that appropriate monitoring and response protocols are in place.

Increased Human Activity and Introduced Predators

1. Develop a Predator Control Plan
    a. The Plan should be developed by a qualified professional and cover the whole site targeting feral cats, possums, mustelids, and rodents. Traps could consist to DOC200s for mustelids and rats, Timms traps for possum and victor traps for mice. Traps will need to be regularly maintained and checked in line with best practice guidelines. Bait stations targeting mice are recommended.
2. Waste Management Plan (to ensure all waste is securely stored).

Based on the above management actions being implemented, e3s considers the impact of the site development to the terrestrial ecology to be low, or less than minor.

7 References

Adams, C. A., Fernández, J. E., Bayne, E. M., & St. Clair, C. C. (2021). Effects of artificial light on bird movement and distribution: a systematic map. *Environmental Evidence , 10*.

Blackwell, B. F., Schafer, L. M., Helon, D. A., & Linnel, M. A. (2008). Bird use of stormwater-management ponds: Decreasing avian attractants on airports. *Landscape and Urban Planning*, 162 - 170.

DCC. (2024). *Second Generation District Plan*. Retrieved October 2025, from https://2gp.dunedin.govt.nz/pages/plan/Book.aspx?exhibit=DCC2GP&hid=64601

DCC. (2025). *Planning Map*. Retrieved 2025, from https://dunedin.maps.arcgis.com/apps/webappviewer/index.html?id=f7fc69e07dba4db589ffe2ddcac4acc7

de Lange, P., Gosden, J., Courtney, S. P., Fergus, A. J., Barkla, J. W., Beadel, S. M., . . . Michel, P. (2024). *Conservation status of vascular plants in Aotearoa New Zealand, 2023. New Zealand Threat Classification Series 43.* Wellington: Department of Conservation.

Department Of Conservation. (2011). The impact of noise on recreationists and wildlife in New Zealand's natural areas A literature review. In M. A. Harbow, G. R. Cessford, & B. J. Kazmierow, *Science for Conservation 314*.

Derraik, G. B., Rufaut, C. G., Closs, G. P., & Dickinson, K. J. (2005). Ground invertebrate fauna associated with native shrubs and exotic pasture in a modified rural landscape, Otago, New Zealand. *New Zealand Journal of Ecology 29(1)*, 129 – 135.

DOC. (2025). *Bat Observations Map*. Retrieved October 2025, from https://docnewzealand.shinyapps.io/shiny/

DOC. (2025). *Ecological Districts*. Retrieved from https://doc-deptconservation.opendata.arcgis.com/datasets/4f40397b253646f0a2ac6898ff4012c5_0/explore?location=-45.004484%2C171.014158%2C7.48

DOC Lizard Technical Advisory Group. (2023). *What information and permissions are required if lizard or frog habitat is to be disturbed or removed? Guidance for developers, consultants, and Department of Conservation staff*. Department of Conservation.

eBird. (2025). Retrieved October 2025, from https://ebird.org/atlasnz/effortmap

Francis, C. D., Ortega , C. P., & Cruz, A. (2009, August). Noise Pollution Changes Avian Communities and Species Interactions. *Current Biology*, 1415-1419.

GNS . (2025). *New Zealand Geology Web Map*. Retrieved 2025, from http://data.gns.cri.nz/geology/

Hitchmough, R. B. (2026). *Conservation status of reptiles in Aotearoa New Zealand, 2025.* Wellington: Department of Conservation. New Zealand Threat Classification Series 50.

Hitchmough, R., Barr, B., Knox, C., Lettink, M., Monks, J., Patterson,, G., . . . Michel, P. (2021). *Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35.* Wellington: Department of Conservation.

iNaturalist. (2025). *Observations*. Retrieved October 2025, from https://www.inaturalist.org/observations

Jarvie, S., Barkla, J., Rance, B., Rogers, G., Ewans, R., & Thorsen, M. (2025). *Conservation Status of Indigenous Vascular Plants in Otago, 2025.* Dunedin: ORC.

Jarvie, S., Knox, C., Monks, J., Purdie, S., Reardon, J., & Campbell, C. (2024). *Conservation Status of Reptile Species in Otago (Otago Threat Classification Series 5)*. Otago Regional Council.

Jarvie, S., McKinlay, B., Palmer, D., Rawlence, N., & Thomas, O. (2025). *Regional conservation status of birds in Otago.* Dunedin: Otago Regional Council, Otago Threat Classification Series.

Leathwick, J., Wilson, G., Rutledge, D., Wardle, P., Morgan, F., Johnston, K., . . . Kirkpatrick, R. (2003). *Land Environements of New Zealand.* Auckland: David Bateman Ltd.

Marangoni, L. F., Davies, T., Smyth, T., Rodiguez, A., Hamann, M., Duarte, C., . . . Levy, O. (2022). Impacts of artifical light at night in marine ecosystems-A review. *Global Change Biology*.

MFE. (2009). *Land Environments New Zealand (LENZ) - Level 4 Polygons (2009)*. Retrieved from https://data.mfe.govt.nz/layer/52358-land-environments-new-zealand-lenz-level-4-polygons-2009/

Ministry for the Environment. (2025). *National Policy Statement for Indigenous Biodiversity 2023 Amended December 2025* . New Zealand Gazette.

MWLR. (2025). *Our Environment* . Retrieved 2025, from https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Habitats/lenz_potnatveg

ORC. (2013). *Natural Hazards on the Taieri Plains, Otago.*

ORC. (2025). *Proposed Otago Regional Policy Statement.* Otago Regional Council . Retrieved 2026

Patrick, B. (1994). *The importance of invertebrate biodiversity : an Otago Conservancy review.* Wellington. 13p.: Conservation Advisory Science Notes No. 53, Department of Conservation.

Richard, F.-J., Southern, I., Gigauri, M., Bellini, G., Rojas, O., & Runde, A. (2021). Warning on nine pollutants and their effects on avian communities. *Global Ecology and Conservation, 32*, 2 - 8.

Robertson, H. A., Baird, K. A., Elliot, G. P., Hitchmough, R. A., McArthur, N. J., Makan, T. D., . . . Michel, P. (2021). *Conservation status of birds in Aotearoa New Zealand.* Department of Conservation.

Roper-Lindsay, J., Fuller, S. A., Hooson, S., Sanders, M. D., & Ussher, G. T. (2018). *Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.* Melbourne, Australia : EIANZ.

Shannon, G., McKenna, M. F., Angeloni, L. M., Crooks, K. R., Fristup, K. M., Brown, E., . . . Wittemyer, G. (2016). Asynthesis of two decades of research documenting the effects of noise on wildlife. *Biological Reviews, 91*, 982 - 1005.

8 Appendix

Appendix 1: Plant Species Recorded Within Vegetation Communities.

Vegetation community	Species present
Grazed Pasture	*Dactylis glomerata, Brassica napus var. napobrassica, Stellaria media, Cirsium vulgare, Urtica incisa, Trifolium repens, Aphanes arvensis, Rumex obtusifolius, Capsella bursa-pastoris, Bellis perennis, Veronica arvensis, Achillea millefolium, Fumaria muralis, Senecio vulgaris, Poa annua.*
Shelterbelts	Eucalyptus*, Chamaecyparis lawsoniana, Pittosporum tenuifolium, Pittosporum eugenioides, Crataegus monogyna, Sambucus nigra.*
Northwest Grassland	*Dactylis glomerata, Vicia sativa, Cytisus scoparius, Ranunculus acris, Achillea millefolium, Ulex europaeus, Taraxacum officinale.*
Stream Edge	*Holcus lanatus, Jacobaea vulgaris, Digitalis purpurea, Prunella vulgaris,Erythranthe guttata, Rubus fruticosus.*
Stream Buffer	*Veronica salicifolia, Rubus fruticosus, Holcus lanatus, Sambucus nigra, Acer pseudoplatanus, Dryopteris affinis, Lamium sp., Trifolium repens, Cytisus scoparius, Ulex europaeus, Dactylis glomerata, Salix cinerea, prunus sp., Crataegus monogyna, Muehlenbeckia australis, Stellaria media, Alnus glutinosa.*

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Current Position

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Formal Qualifications.

MSc (Ecology), University of Otago, New Zealand, 2011.
BSc (Ecology Major; Statistics Minor), University of Otago, New Zealand, 2007.

Technical Capabilities

Ecological Impact Assessments, Ecological Management Plans, Restoration Plans, Planting Plans, and management of landscape-scale predator control programs.

Software Capabilities

ArcGIS, QGIS, Statistical Package for the Social Sciences (SPSS), Office 365.

Career Summary

Rebecca is a terrestrial ecologist with over twelve years' experience in ecological assessment, monitoring, restoration planning, and conservation management. She has worked across both public and private sectors, managing landscape-scale predator control programs, conducting Ecological Impact Assessments for a range of land-use activities, and leading major restoration projects. Rebecca has expertise in ecological survey design and implementation, statistical analysis, and leading large-scale conservation responses, including incursion responses and aerial control operations. She also has experience in providing expert ecological evidence for judicial proceedings, stakeholder engagement, and working in partnership with iwi. As Technical Director of the Terrestrial Ecology Team, Rebecca oversees all projects, providing guidance, and reviewing and certifying reports. Rebecca is a Certified Environmental Practitioner (CEnvP), holds Level 3 certification in the Coordinated Incident Management System (CIMS), and serves as a Trustee of the Routeburn Dart Wildlife Trust.

Affiliations

- The Environmental Institute of Australia and New Zealand (EIANZ) – Full Member.
- Certified Environmental Practitioner (CEnvP) No. 908.
- The New Zealand Ecological Society (NZES) – Full Member.
- Birds New Zealand / Te Kāhui Mātai Manu o Aotearoa

Key Projects

- Proposal for the Native Revegetation of Coronet Forest Post-Harvest.
- Treespace Ecological Management and Monitoring.
- Coronet Faces Ecological Management Plan.